

REMARKS

CLAIM OBJECTIONS

Claims 20, 24-26, 30, 32 and 34-36 are objected to because of the following informalities: claim 20 recites “providing a solvent mixture, wherein the solvent mixture comprises an active solvent component and at least one non-solvent component.” The Original Specification, page 8, describes the “solvent mixture” as: “the solvent mixture generally comprises at least one solvent (*i.e.*, a composition that breaks down and/or dissolves the spin-on film, also referred to as active component) and at least one non-solvent (*i.e.*, a composition that is inert to the spin-on film or that breaks down and/or dissolves the spin-on film at a rate of at least 10 times less than the solvent).”. The Applicant respectfully requests that the Examiner provide more information as to the informality. The Applicant isn’t sure what the Examiner’s objection is referring to other than the fact that the solvent mixture contains a non-solvent component and the Examiner is objecting to a non-solvent component being in a solvent mixture – despite how the specification defines the solvent mixture. If this is correct, the Applicant requests immediate clarification so that the appropriate action may be taken by the Applicant.

35 USC §102

Claims 20, 26, 32, 34 and 36 are rejected under 35 USC 102(e) as being anticipated by Huang et al. (US 6,485,576). The Applicant respectfully disagrees.

Claim 20 recites:

“A method of removing a spin-on compound, comprising:

spin-depositing a spin-on compound on a surface of a substrate, wherein the spin-on compound comprises silicon;

providing a solvent mixture, wherein the solvent mixture comprises an active solvent component and at least one non-solvent component, wherein the active component comprises a ketone, an ester, an ether, a hydrocarbon or a combination thereof.; and

spin-rinsing the spin-on compound with a solvent mixture, wherein the solvent mixture comprises the active solvent component dissolves the spin-on compound, and the non-solvent component is inert to the spin-on compound.”

The Huang reference discloses “suitable cleaning solutions” for cleaning SOG or photoresist material from a wafer flat side, such that “a build up of the coating material and possible cracking in subsequent processing steps can be prevented.” (See Column 3, lines 21-26). In addition, Huang teaches that “suitable cleaning solutions” is a mixture of EL-100 and isopropyl alcohol. Huang also admits that other solvents may be used as long as “a desirable viscosity range and flow properties of the mixture can be achieved.” Huang does not teach or disclose an active component comprising a ketone, an ester, an ether, a hydrocarbon or a combination thereof. The only requirement disclosed in Huang as to solvent properties is that they are suitably mixed “such that a desirable viscosity or flow property of the mixture can be obtained to carry out the present invention method”; and therefore it is not recognized or appreciated that the solvents in the Huang patent should be mixed in

order to achieve different goals – such as breaking down and/or dissolving the material. Every blend of solvents does not achieve the same goal. There is no requirement that one of the components of the solvent mixture be an “active solvent component” which breaks down and/or dissolves the material and that the other component be a non-solvent component that is inert and/or does not break down the material. There is also no description that one of the components of the solvent mixture is an “active solvent component” which breaks down and/or dissolves the material and that the other component is a non-solvent that is inert and/or does not break down the material. In Huang, an inactive solvent component or a non-solvent that interacts with the material may in fact be contemplated, unlike the present application.

In addition, Huang does not teach all of the claimed elements of the present application. “Anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration.” *W. L. Gore & Assocs. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Cir. 1983) (citing *Soundsciber Corp. v. United States*, 360 F.2d 954, 148 USPQ 298, 301 (Ct. Cl.), *adopted*, 149 USPQ 640 (Ct. Cl. 1966)) Further, the prior art reference must disclose each element of the claimed invention “**arranged as in the claim**”. *Lindermann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984)(citing *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 220 USPQ 193 (Fed. Cir. 1983)). Huang does not teach a composition that breaks down and/or dissolves the spin-on film, also referred to as active component. Based on this argument, along with others such as that discussed above, Huang does not anticipate claim 20 of the present application because Huang is lacking and/or missing at least one specific feature or structural recitation found in the present application, and in claim 20. Claim 20 is therefore allowable as not being anticipated by Huang. Further, Huang does not anticipate claims 26, 32, 34 and 36 of the present application by virtue of their dependency on claim 20.

Claims 20 and 33 are rejected under 35 USC 102(b) as being anticipated by Yamashita et al. (US 5,779,928). The Applicant respectfully disagrees.

Claim 20 recites:

“A method of removing a spin-on compound, comprising:

spin-depositing a spin-on compound on a surface of a substrate, wherein the spin-on compound comprises silicon;

providing a solvent mixture, wherein the solvent mixture comprises an active solvent component and at least one non-solvent component, wherein the active component comprises a ketone, an ester, an ether, a hydrocarbon or a combination thereof.; and

spin-rinsing the spin-on compound with a solvent mixture, wherein the solvent mixture comprises the active solvent component dissolves the spin-on compound, and the non-solvent component is inert to the spin-on compound.”

The Examiner states that Yamashita contemplated hydrocarbons, but the abstract clearly states that the solvent list consists of 4 solvents – none of which are hydrocarbons. The abstract and specification discloses that the solvents consist of butyrolactone, ethyl lactate, cyclohexanone or ethyl pyruvate. The Applicant respectfully requests that the Examiner reconsider this rejection and remove it from the record going forward.

35 USC §103

Claim 35 are rejected under 35 USC 103(a) as being obvious over Huang et al. (US 6,485,576) in view of Yoshida et al. (US 6,534,595). The Applicant respectfully disagrees.

Claim 20 recites:

“A method of removing a spin-on compound, comprising:

spin-depositing a spin-on compound on a surface of a substrate, wherein the spin-on compound comprises silicon;

providing a solvent mixture, wherein the solvent mixture comprises an active solvent component and at least one non-solvent component, wherein the active component comprises a ketone, an ester, an ether, a hydrocarbon or a combination thereof.; and

spin-rinsing the spin-on compound with a solvent mixture, wherein the solvent mixture comprises the active solvent component dissolves the spin-on compound, and the non-solvent component is inert to the spin-on compound.”

The Huang reference discloses “suitable cleaning solutions” for cleaning SOG or photoresist material from a wafer flat side, such that “a build up of the coating material and possible cracking in subsequent processing steps can be prevented.” (See Column 3, lines 21-26). In addition, Huang teaches that “suitable cleaning solutions” is a mixture of EL-100 and isopropyl alcohol. Huang also admits that other solvents may be used as long as “a desirable viscosity range and flow properties of the mixture can be achieved.” Huang does not teach or disclose an active component comprising a ketone, an ester, an ether, a hydrocarbon or a combination thereof. The only requirement disclosed in Huang as to solvent properties is that they are suitably mixed “such that a desirable viscosity or flow property of the mixture can be obtained to carry out the present invention method”; and therefore it is not recognized or appreciated that the solvents in the Huang patent should be mixed in

order to achieve different goals – such as breaking down and/or dissolving the material. Every blend of solvents does not achieve the same goal. There is no requirement that one of the components of the solvent mixture be an “active solvent component” which breaks down and/or dissolves the material and that the other component be a non-solvent component that is inert and/or does not break down the material. There is also no description that one of the components of the solvent mixture is an “active solvent component” which breaks down and/or dissolves the material and that the other component is a non-solvent that is inert and/or does not break down the material. In Huang, an inactive solvent component or a non-solvent that interacts with the material may in fact be contemplated, unlike the present application.

The Yoshida reference discloses coating solutions for forming porous organic films. Yoshida does contemplate utilizing propyl acetate; however Yoshida does not contemplate using these solvents on spin-on compounds comprising silicon. Yoshida states in Column 6, lines 23-38 that the solvent is chosen to be a compatibilizing agent to the components of the coating solutions, which are organic. Therefore, Yoshida does not mention using propyl acetate as a suitable solvent for spin-on materials comprising silicon. There is absolutely no teaching, motivation or suggestion in Yoshida that would lead one of ordinary skill in the art to combine with Huang to get the subject matter taught in the present application, especially in view of the paragraph in Column 6, lines 23-38 from the Yoshida reference. And, if there is no teaching, suggestion or motivation in either the Huang reference or the Yoshida references to combine them, then the present independent claims must be found in either one of the references, and that clearly is not the case based on the above arguments.

Therefore, based on the above arguments, claim 20 is patentable over the Huang reference in view of the Yoshida reference. In addition, claims 33 and 35 are patentable over the Huang reference in view of the Yoshida reference by virtue of their dependency on independent claim 20.

Claims 24-25 are rejected under 35 USC 103(a) as being obvious over Huang et al. (US 6,485,576) and Kalnitsky et al. (US 5,435,888). The Applicant respectfully disagrees.

Claim 20 recites:

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“A method of removing a spin-on compound, comprising:

spin-depositing a spin-on compound on a surface of a substrate, wherein the spin-on compound comprises silicon;

providing a solvent mixture, wherein the solvent mixture comprises an active solvent component and at least one non-solvent component, wherein the active component comprises a ketone, an ester, an ether, a hydrocarbon or a combination thereof.; and

spin-rinsing the spin-on compound with a solvent mixture, wherein the solvent mixture comprises the active solvent component dissolves the spin-on compound, and the non-solvent component is inert to the spin-on compound.”

The Huang reference discloses “suitable cleaning solutions” for cleaning SOG or photoresist material from a wafer flat side, such that “a build up of the coating material and possible cracking in subsequent processing steps can be prevented.” (See Column 3, lines 21-26). In addition, Huang teaches that “suitable cleaning solutions” is a mixture of EL-100 and isopropyl alcohol. Huang also admits that other solvents may be used as long as “a desirable viscosity range and flow properties of the mixture can be achieved.” Huang does not teach or disclose an active component comprising a ketone, an ester, an ether, a hydrocarbon or a combination thereof. The only requirement disclosed in Huang as to solvent properties is that they are suitably mixed “such that a desirable viscosity or flow property of the mixture can be obtained to carry out the present invention method”; and therefore it is not recognized or appreciated that the solvents in the Huang patent should be mixed in

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Since Kalnitsky does not correct the deficiency of Huang and does not show motivation to combine Huang and Kalnitsky and does not itself refer to the use of a solvent mixture, wherein the solvent mixture comprises an active component and at least one non-solvent component, Kalnitsky cannot be combined with the Huang references to arrive at the subject matter of the present invention.

Therefore, based on the above arguments, claim 20 is patentable over the Huang reference in view of the Kalnitsky reference. In addition, claims 24 and 35 are patentable over the Huang reference in view of the Kalnitsky reference by virtue of their dependency on independent claim 20.

REQUEST FOR ALLOWANCE

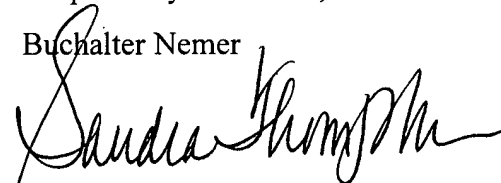
Claims 20, 24-26, 30, 32 and 34-36 are currently pending in this application, and the Applicant respectfully requests that the Examiner reconsider all of the claims in light of the arguments presented and allow all current and pending claims.

Respectfully submitted,

Buchalter Nemer

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